# Report and Recommendations of the Committee for Recruitment of a Diverse Workforce in Medical Research

**Many Americans born into minority racial and ethnic groups experience disproportionately higher infant mortality, lower rates of childhood vaccination, later diagnosis of treatable neoplasms, higher prevalence of cardiovascular disease and diabetes, and shorter life spans than does the population as a whole. Awareness of the differences in disease burden between the majority population and Americans who are in minority groups or of lower socioeconomic status is growing. In addition, as a result of the demographic changes expected over the next 50 years, a majority of Americans will be members of groups that have historically been medically disadvantaged.**

**Health disparities are due to a number of factors, including access to social and economic resources, level of education, and occupation. Efforts to reduce these health disparities have typically targeted individual subpopulations, such as low-income persons, racial and ethnic minorities, women, and persons with disabilities. But as the proportion of medically underserved Americans continues to increase, along with the magnitude and cost of meeting these health disparities, this narrow approach appears increasingly inadequate.**

**Reducing the disparities will require multiple fresh approaches including (1) increased local, regional, and national literacy in science and health, so as to improve prenatal care, early childhood development, school readiness, and primary, secondary, and postsecondary education, and (2) increased inclusion of minorities in the health and medical research professions.**

**While it is clear that a researcher need not come from a minority or a disadvantaged background to contribute to the understanding and remediation of health disparities, it is reasonable to expect that such individuals as a group would possess greater motivation and**

**persistence, as well as familiarity and insight into these problems. Therefore, effective recruiting efforts should tap into this talent pool and focus on bringing underrepresented groups into biomedical research.**

**NIH is well suited to undertake the second approach -- to plan, implement, and coordinate training programs that have the potential to reduce health disparities by fostering inclusion of affected populations in the health and medical research professions. Such programs -- set amidst a wealth of scientific opportunities available today, and, against the backdrop of growing public health demands in this country -- could increase the depth and breadth of the nation's talent pool in health research in basic, translational, and clinical studies. There is an urgent national need for researchers who can advance public health through scientific discovery, and for clinicians who can deliver the benefits of this research to an increasingly diverse population.**

**Up to now, decades of efforts to attract pre-college, undergraduate, predoctoral, and postdoctoral students to biomedical careers have yielded a paucity of minority investigators who engage in research. For example, Hispanics, African Americans, Native Americans, and Pacific Islanders represent almost 30 percent of the total population, but are markedly underrepresented as students, researchers, and academicians in the physical, chemical, biological, and health sciences. During the last decade, representation of these minorities in science has increased, but even today, they receive only six percent of the doctorates awarded annually in biology.**

**It is imperative that we draw widely on the intellectual capital required to reduce disease burden and enhance quality of life for more Americans, regardless of socioeconomic status. NIH-supported research and biomedical training programs are located in Bethesda, Maryland (Intramural Research Program), and in every state in the Union (extramural grants programs). Improved coordination among NIH programs and those of other federal and state agencies, academic health centers, health and research professional organizations, and the private sector will sustain a robust and more inclusive medical research**

**community that is better prepared to succeed in reducing disease disparities.**

**After extensive study and analysis, the Committee offers five recommendations to increase the number of research scientists prepared to tackle these problems. These recommendations address both recruitment and retention and propose a sustained effort to educate and nurture an outstanding, diverse, and competitive scientific workforce. The recommendations do not require new funding mechanisms, but rather increased resources and a commitment to include individuals from many diverse backgrounds in the medical research enterprise. Success in implementing the recommendations will require the cooperation and counsel of partner organizations with NIH, including, but not limited to, the Association of American Medical Colleges (AAMC), the American Association of Dental Schools, the Howard Hughes Medical Institute, the Robert Wood Johnson Foundation, the National Medical and Dental Associations, the National Hispanic Medical and Dental Associations, the American Association for the Advancement of Science, and the Association of American Indian Physicians.**

## Recommendation 1: Create an NIH Academy

**We recommend creating an NIH Academy to serve as a nexus for recruiting and training a diverse population of scholars—from high school past doctoral studies—as they pursue careers in the health sciences. The proposed NIH Academy would be a model training forum located initially at the Bethesda campus of the Intramural Research Program. The specific design of the Academy would be recommended by a group of scientists, administrators, and educators with the experience and motivation to improve recruitment, training, and mentoring of a diverse new generation of scientists. The proposed Academy would encompass the coordination of existing training and recruiting programs and would also include new mentoring-intensive residential and local programs to train and advance the early biomedical**

**careers of these scientists. With an emphasis on integration and connectivity of programs, the Academy would cultivate the talents of underrepresented scientists and others who could make a contribution in reducing health disparities.**

**After appropriate evaluation, the NIH Academy could expand to be based at academic health science institutions throughout the United States. The Academy requires a commitment across all NIH institutes and centers and from the leaders of both the intramural and extramural programs. Creating the Academy will require increased funding and allocation of resources for research training.**

**Based on the available literature, suggestions from a large number of diverse groups, and the wisdom of many experts in this area, the committee sees four elements that will be critical for the success of the NIH Academy:**

**Critical Element A: Mentoring**

**Success within the intramural environment requires solid and sustained mentoring from NIH staff with consistent support and leadership from the NIH Director, Institute Directors, Scientific Directors, and Laboratory / Branch Chiefs. The dedication of NIH mentors as teachers and role models will be fundamental to the intramural Academy's success. When the extramural Academy is created, it will require the same dedication and leadership from faculty, staff, and administrators of academic health science centers.**

**Critical Element B: Residential Program**

**A residential program that supports students or fellows working and living together will reinforce the encouragement and counsel of mentors. A residential format fosters a sense of community and purpose and is essential for success.**

**Critical Element C: Continuity of Support**

**Students of the NIH Academy must be nurtured through the continuum of training -- from summer high school programs through college and**

**graduate school, and post-residency and postdoctoral studies. (See Box for one example). Public and private support must be marshaled to support summer research, residential fellowships, scholarships, student loan repayment, and transitions from one career stage to another. NIH support during graduate years may take the form of fellowships while a student is enrolled in an existing graduate program or, in the case of a few clinical trainees, might occur at a new graduate program—still in preliminary discussion stages—in association with the Clinical Research Center at NIH. Transition to the extramural environment after training should receive particular emphasis, possibly with support from early career development grants like those awarded through the K22 program, which provides transitional support for early career investigators moving from the intramural program to the extramural program.**

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**Box:**

**The NIH experience of one extraordinary young scientist, Jose Vargas, serves as a model for the potential success of the NIH Academy.**

**An immigrant to the United States from the Dominican Republic at the age of 13, Vargas was nominated for the NIH-FAES-HHMI Summer Internship Program in 1994 when he was a student at Colonel Zadok Magruder High School in Rockville, Maryland. He was accepted to the program and worked in the intramural research lab of Sharon Wahl in NIDCR's Oral Infection and Immunity Branch for two summers, under the mentorship of senior research assistant Nancy McCartney-Francis.**

**This summer program prepared Vargas well as an applicant for support in 1996 from the Undergraduate Scholarship Program (UGSP) as a student at Loyola College in Baltimore, Maryland. The UGSP awards service-connected scholarships of up to $20,000 per school year to individuals from disadvantaged backgrounds who show a commitment to pursuing a career in biomedical research. For each year of UGSP support, the scholars work at NIH during the summer for 10 weeks, obtaining paid laboratory-based**

**research experience. The UGSP provides group learning experiences and training in writing, public speaking, and abstract and poster presentations, as well as a strong mentoring and support system. During his college summers, Vargas continued working in the intramural research program, in the NICHD Cell Biology and Metabolism Branch (CBMB), under the guidance of mentor Juan Bonifacino, a senior scientist and Chief of the CBMB.**

**In 1998, Vargas won prestigious Rhodes and Marshall scholarships and has accepted the Rhodes scholarship for study at Oxford University in Oxford, England. Following that, he expects to return to Harvard Medical School in Boston, where he will be at least informally mentored by Joan Reede, Associate Dean for Minority Faculty Development and Diversity, a member of the UGSP advisory committee with close contacts to Vargas' NIH mentors. Following medical training, Vargas will return to NIH to repay his UGSP debt as an intramural postdoctoral researcher. We anticipate Vargas' future mentors—who doubtless will be colleagues of his former mentors—will advise him on the best postdoctoral training and will smooth his transition to an extramural or intramural research career.**

**It seems likely that several of the elements identified as critical to the success of the proposed NIH Academy -- including mentor involvement, program continuity, financial support, and attention to career transitions --helped to create an environment in which Vargas' abundant scientific talents could develop and grow.**

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**Critical Element D: <u>Community Involvement</u>**

**The experience and motivation of NIH Academy students and fellows will be enriched by opportunities to work on research problems in targeted communities close to the various Academies.**

**Recommendation 2: Increase the Number of Scientists Addressing Health Disparities**

**A major national effort should be initiated to identify, recruit, and train highly talented individuals who have completed clinical and postdoctoral programs and possess a strong interest in reducing disease disparities. Particular emphasis should be placed on recruiting underrepresented minority, disabled, and economically disadvantaged individuals.**

**This type of recruitment effort has two significant advantages: (1) It would begin to yield results in as little as five years because it is focused on individuals who have already completed clinical residency and postdoctoral programs, and (2) Additional talented individuals may be attracted into the field by expanding and raising the visibility of scientific opportunities associated with health disparities by making them areas of special budgetary emphasis.**

**These scholars should be drawn from the behavioral, environmental, and biological doctorate programs and clinical residencies in the health sciences, including medicine, dentistry, pharmacy, nursing, laboratory animal medicine, and allied health professions. With the collaboration of organizations such as the AAMC and the Robert Wood Johnson Foundation, the goal of this effort would be to identify and recruit the most promising clinical residents and postdoctoral fellows. The program would provide clinical research training and subsequent support, including bridge and start-up grants to enable recently trained individuals to become established within academic health science centers.**

**The goal of this effort is to provide patient- and disease-oriented training for a diverse cadre of individuals who will go on to receive research grant support and enter academic positions. Extant NIH programs, such as the career development awards (K23 and K30), and the newly developed bridge grants provided by several Institutes could be used to implement this recommendation. Because such mechanisms are in place, only increased emphasis, coordination, evaluation, and commitment of funds are needed. Enhanced attention to nurturing and mentoring scientists during their early career development should also be incorporated in these programs.**

**Recommendation 3: Enhance NIH Grant Supplement Awards**

**The NIH has had a Minority and Disability Supplements program for many years. These grant supplements have been available to NIH-funded principal investigators who place disabled and underrepresented minority students and trainees on their research teams, thereby encouraging these individuals to pursue careers in biomedical science.**

**We recommend replacing these minority / disability-directed programs with a General Supplements program available to all of our nation's talent in science, particularly disadvantaged individuals of any race who traditionally might not have had such opportunities. This broadened program should track and evaluate participating students and mentors.**

**Because the minority and disability supplements have historically been underutilized, we recommend national efforts to provide information and recruit students, investigators, and faculty advisors to apply for such NIH-supported opportunities. These might include public service announcements, brochures distributed to high school and university faculty advisors, and active information programs by organizations like the AAMC and other medical, dental, and scientific associations, in addition to publicity efforts already underway at NIH.**

**Recommendation 4: Foster Linkages between Research-Intensive and Other Institutions**

**Many underrepresented minority students earn their undergraduate degrees at historically black colleges or universities or at a comparatively small number of institutions in states with the largest populations of Hispanics, American Indians, and Pacific Islanders. These institutions provide very good science instruction, yet often are unable to provide extensive medical research experiences on their campuses. We recommend increased NIH efforts to establish bridge grants, similar to those already existing in several Institutes, which fund collaborations between research-intensive universities and nearby institutions that serve predominantly**

**minority populations. The goal of these efforts would be to offer a diverse group of students and faculty members the opportunity to collaborate.**

**Recommendation 5: Coordinate, Publicize, and Evaluate Programs**

**There is no shortage of programs at the NIH, other government science agencies, and non-federal organizations intended to create a diverse science technology workforce for the 21st century. There is, however, a lack of coordination and evaluation within and among these programs. For years, well-intentioned programs have continued without periodic evaluation and review of their success. We recommend that NIH identify leadership to survey its own Institutes in collaboration with other public and private agencies entaged in science and technology. The review would have three goals:**

**A. Identify the various programs sponsored by public and private organizations.**

**B. Encourage public and private organizations to collaborate on national campaigns to inform a diverse population of students about careers in science and technology and to direct them systematically to available programs.**

**C. Evaluate the programs in terms of their cost and effectiveness in recruiting and retaining individuals who traditionally might not have pursued career opportunities in science.**

**Summary**

**Implementing these five recommendations can advance the NIH mission, which is to improve the health of the country by sponsoring and conducting biomedical research and training. The changing demographics and patterns of disease in this country clearly require new approaches.**

**The committee has learned, through many interviews, discussions, and analyses of the literature, that the scarcity of minorities in health sciences and medical research is very real. There is much more work for public and private organizations and primary, secondary, and postsecondary educational institutions to do in improving the academic performance of all American students. We have come to appreciate that the image of a "pipeline" of students feeding the science workforce is misleading since it suggests a smooth, well-defined, and predictable passage from elementary school to college, graduate training, and into a science career. The route is more akin to a winding trail loaded with predictable and unpredictable obstacles, any one of which can cause the trail to be abandoned. The NIH Academy could help students find and traverse the length of this difficult path with involved mentors as guides.**

**We believe the time is right to implement the five recommendations above. These measures should result in significant progress in reducing health disparities by broadly engaging the nation's diverse talent pool in the excitement and fulfillment of biomedical research careers today.**

## Key References

**Association of American Medical Colleges. 1998 Feb. 5** *Project 3000 x 2000 Overview*. **Project 3000 by 2000 Health Professions Partnership Initiative: Second Round of Grant Funding. Project 3000 x 2000 Year Four Progress Report. Press Release: The Robert Wood Foundation and the Association of American Medical Colleges (AAMC) announce Health Professions Partnership Initiative (HPPI). Washington, DC.**

**Association of American Medical Colleges. Prepared by the Section for Student Services.1997 Oct.** *Facts, Applicants, Matriculants, Graduates 1991-1997*. **Washington, DC.**

**Department of Education, National Center for Education Statistics. 1998 Jan.** *Digest of Education Statistics* **1997. http://nces.ed.gov/pubs/digest97/**

**National Institutes of Health (US). Office of Research on Minority Health. 1997 Sept**. *Minority Community Meetings Report: Minority Health Research and Health.* **Bethesda, MD**.

**National Science Foundation. Women, Minorities and Persons with Disabilities in Science and Engineering.1996.** *Research Training*. **Arlington, VA. (NSF 96-311).**

**National Science Foundation. Directorate for Social, Behavioral, and Economic Sciences, Division of Science Resources Studies.** *Survey of Graduate Students and Postdoctoral Fellows in Science and Engineering (Graduate Student Surveys*). **http://www.nsf.gov/sbe/srs/gss/start.htm**

## Committee Members

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| **Marvin Cassman** | **NIGMS** |
| **Naomi Churchill** | **OEO** |
| **Michael Gottesman** | **OIR** |
| **Stephen Katz** | **NIAMS** |
| **Ruth Kirschstein** | **OD** |
| **Claude Lenfant** | **NHLBI** |
| **Yvonne Maddox** | **NICHD** |
| **Kenneth Olden** | **NIEHS** |
| **Audrey Penn** | **NINDS** |
| **Clifton Poodry** | **NIGMS** |
| **Hal Slavkin (Chair)** | **NIDCR** |
| **Sanya Springfield** | **NCI** |
| **Cheryl Stevens (Staffing)** | **NIDCR** |

## Consultants and Advisors to the Committee

**Kathy Bryant, Howard Hughes Medical Institute**

**Joan Burrelli, National Science Foundation**

**George Counts, NIH, Council on Diversity**

**Barbara Filner, Howard Hughes Medical Institute**

**James Gavin, Howard Hughes Medical Institute**

**Alfred Gordon, NIH, National Institute of Neurological Disorders and Stroke**

**Marc Horowitz, NIH, Office of Loan Repayment and Scholarship**

**Freeman Hrabowski, Meyerhoff Scholarship Program, University of Maryland, Baltimore Campus**

**Lillian Johnson, American Association of Medical Colleges**

**Shirley Malcolm, American Association for the Advancement of Science**

**Joseph Perpich, Howard Hughes Medical Institute**

**Paul Robertson, NIH, Office of General Counsel**

**John Ruffin, NIH, Office of Research on Minority Health**

**Walter Schaffer, NIH, Office of Extramural Research**

**Jennifer Sutton, National Research Council, National Academy of Sciences**

**Diane Wax, NIH, Director, Office of Legislative Policy and Analysis**